



# Oil and Gas Industry Day

February 26, 2019



# Oil and Gas Production/Water Disposal

Discount Rate



# Cap Rate Variables

- Comparable Companies
- Capital Structure
- Debt Rate
- Equity Rate

# Comparable Companies

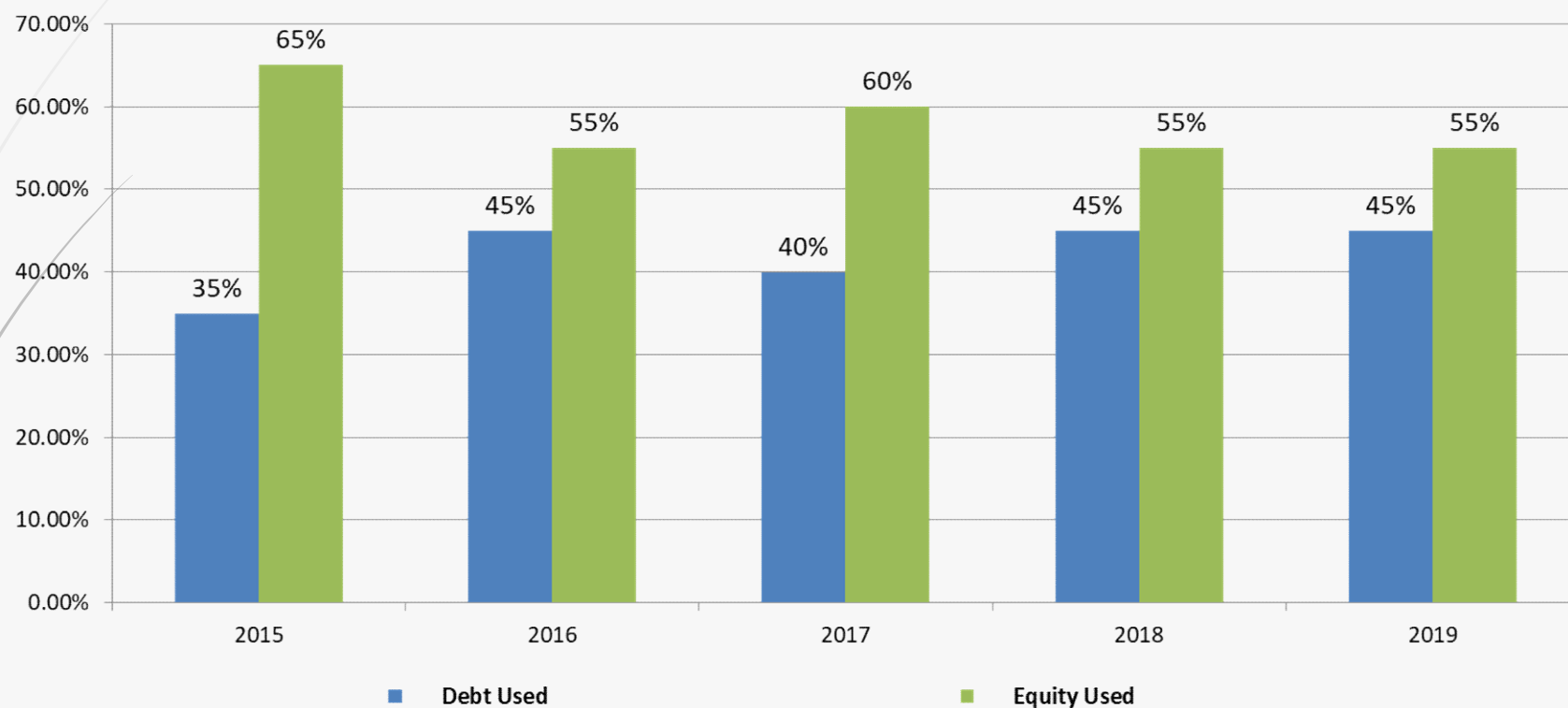
## 2018

- ABRAXAS PETROL
- **BILL BARRETT CORP**
- BLACK STONE MINERALS
- CARRIZO OIL & GAS
- CONTINENTAL RESOURCES
- DENBURY RESOURCES
- ENCANA CORP.
- LEGACY RESERVES
- NEWFIELD EXPLORATION
- PIONEER NATURAL RES.
- QEP RESOURCES
- RESOLUTE ENERGY CORP
- SM ENERGY CO
- SOUTHWESTERN ENERGY
- WHITING PETROLEUM
- WPX ENERGY

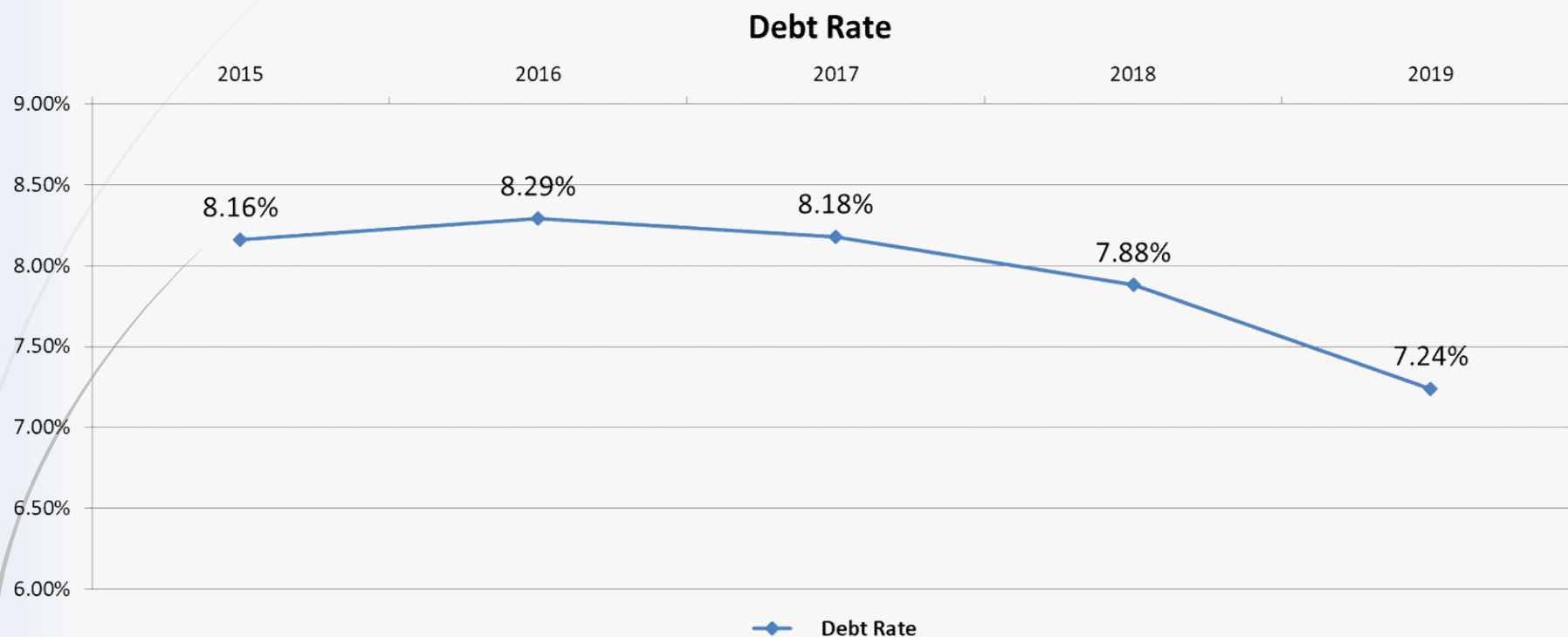
## 2019

- ABRAXAS PETROL
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## 5 Year Capital Structure History

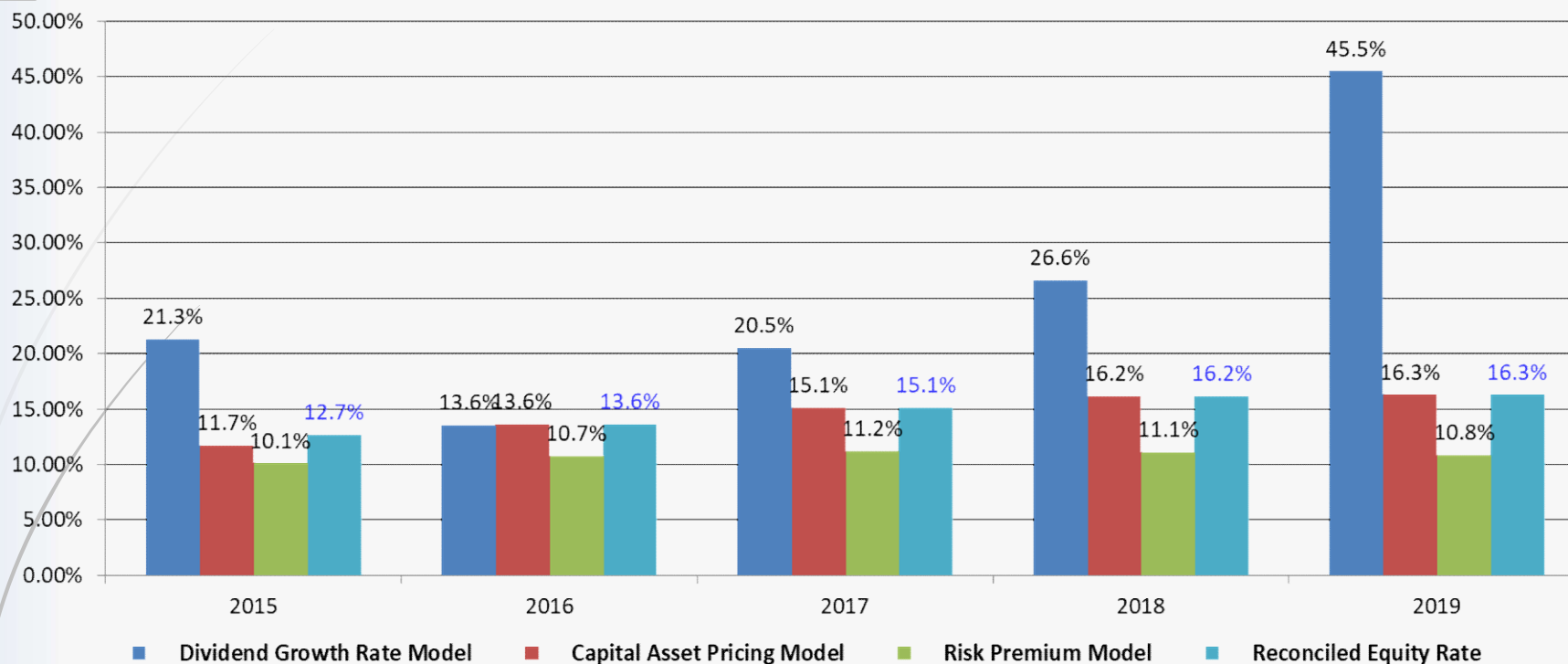


## 5 Year Debt Rate History



\*Average of comparable company debt ratings

## 5 Year Equity Rate History



\*Reconciled equity rate weighted for calculation method

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$

## Production/WD Discount Rate

Weighted Average Cost of Capital Discount Rate Calculation			
	Rate	Capital Structure	Weighted Rate
Debt (Ba3)	7.24%	45%	3.26%
Equity	16.28%	55%	8.95%
Before Taxes WACC			<b>12.21%</b>
Tax Adjusted WACC			<b>15.20%</b>

\*Updated Market Risk Premium will slightly affect the CAPM and therefore, WACC

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$





# Oil and Gas Gathering

Discount Rate

## Comparable Companies

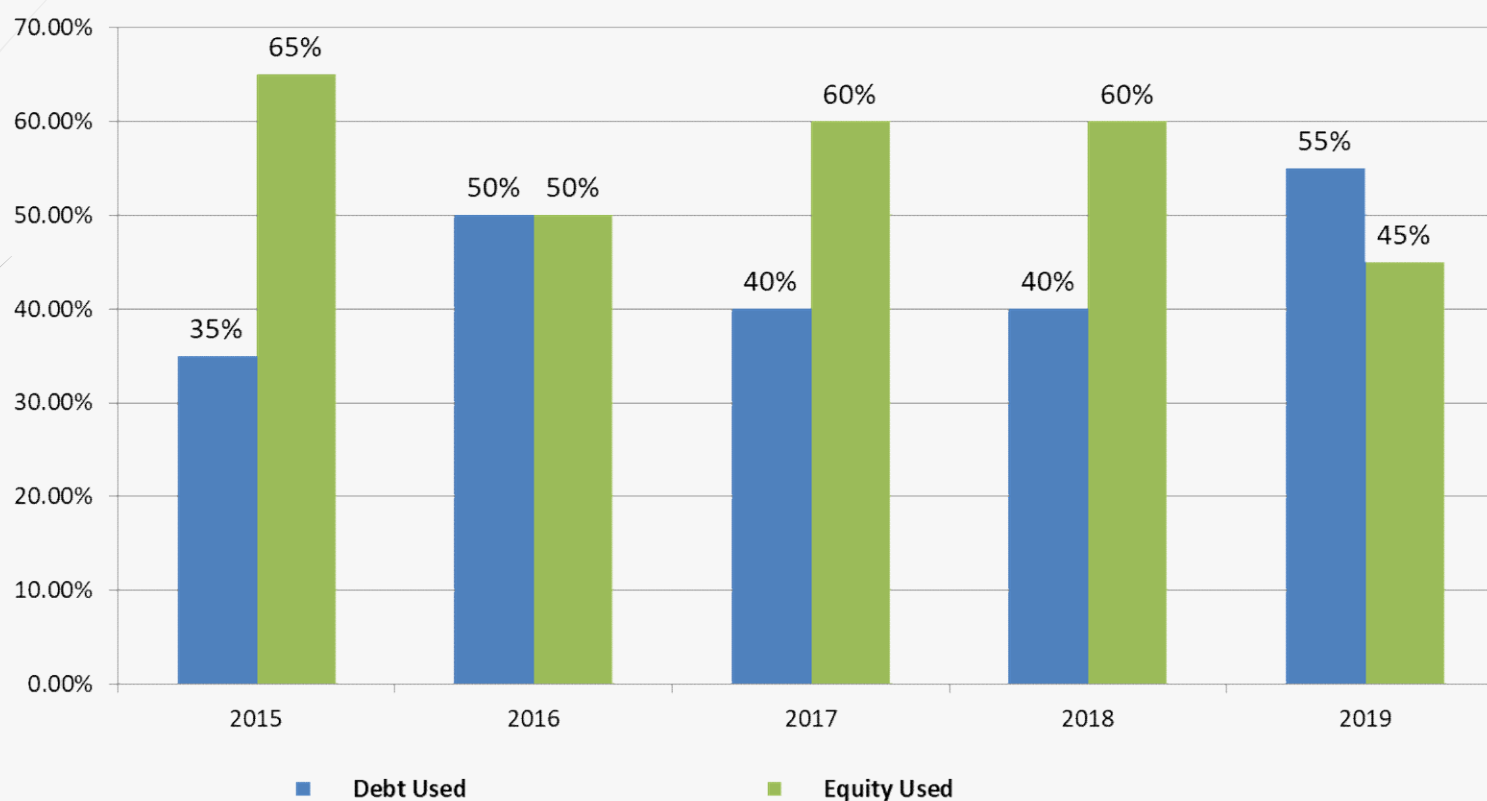
2018

- Crestwood Equity Partners
- Dominion Energy
- Energy Transfer Partners
- Plains All American Pipeline
- Summit Midstream Partners
- Tallgrass Energy Partners
- Western Gas Partners
- Williams Cos

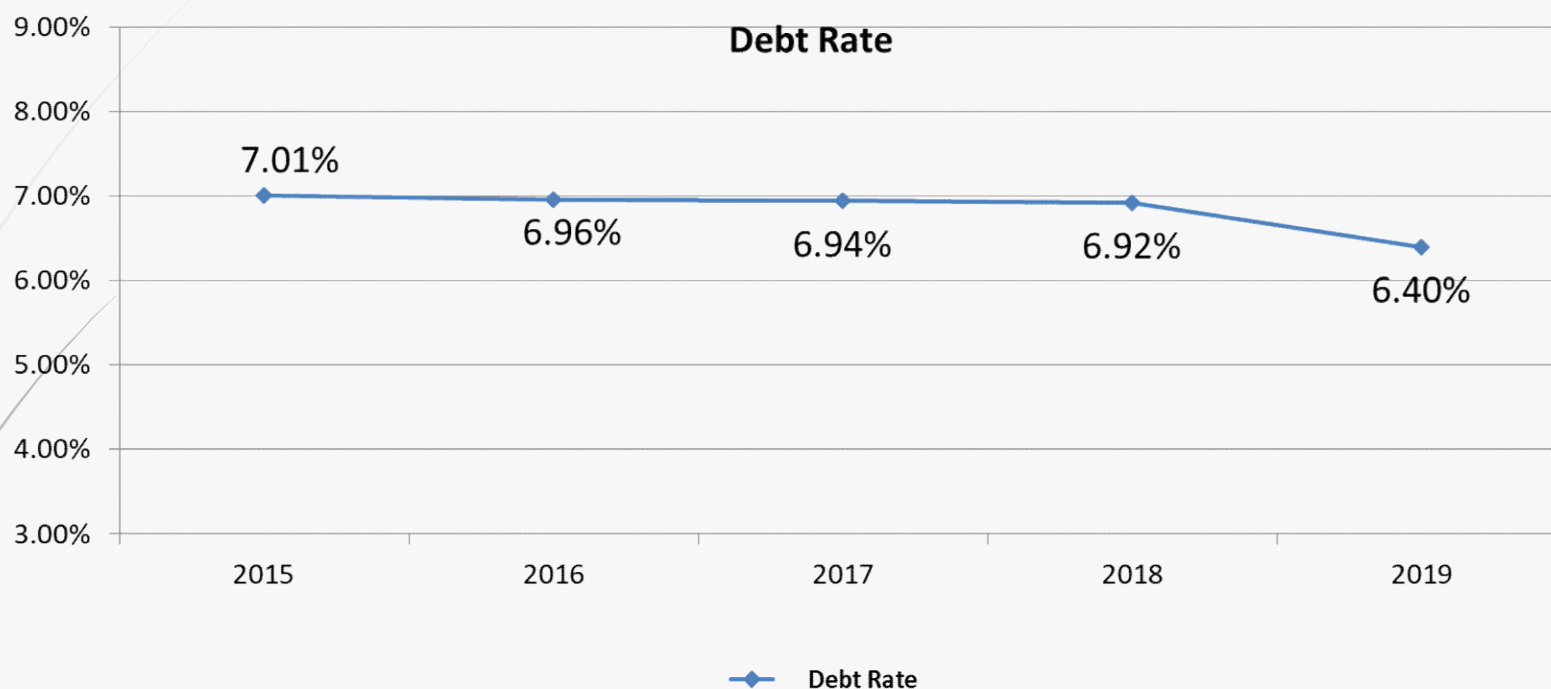
2019

- Crestwood Equity Partners
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## 5 Year Capital Structure History

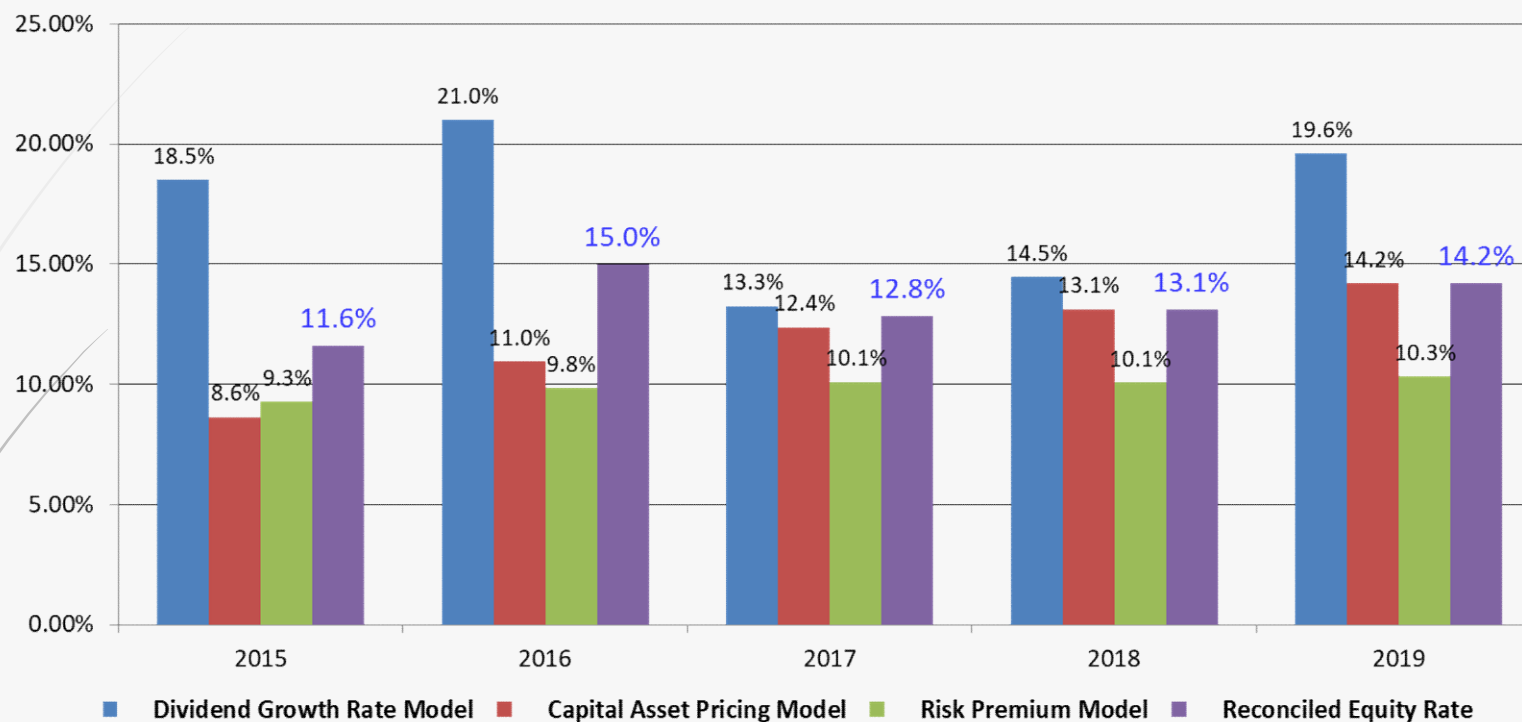


## 5 Year Debt Rate History



\*Average of comparable company debt ratings

## 5 Year Equity Rate History



\*Reconciled equity rate weighted for calculation method

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$

## Oil and Gas Gathering Discount Rate


Weighted Average Cost of Capital Discount Rate Calculation			
	Rate	Capital Structure	Weighted Rate
Debt (Ba3)	6.40%	55%	3.52%
Equity	14.20%	45%	6.39%
Before Taxes WACC			<b>9.91%</b>
Tax Adjusted WACC			<b>12.40%</b>

\*Updated Market Risk Premium will slightly affect the CAPM and therefore, WACC

$$\text{CAPM} = R_f + \beta(R_m - R_f)$$



# Natural Gas Price Forecast 2019



# Utah 2018- Overview

- National statistics
- Utah gas well statistics
- Utah State Tax Commission gas price forecast



# Natural Gas Price Forecast

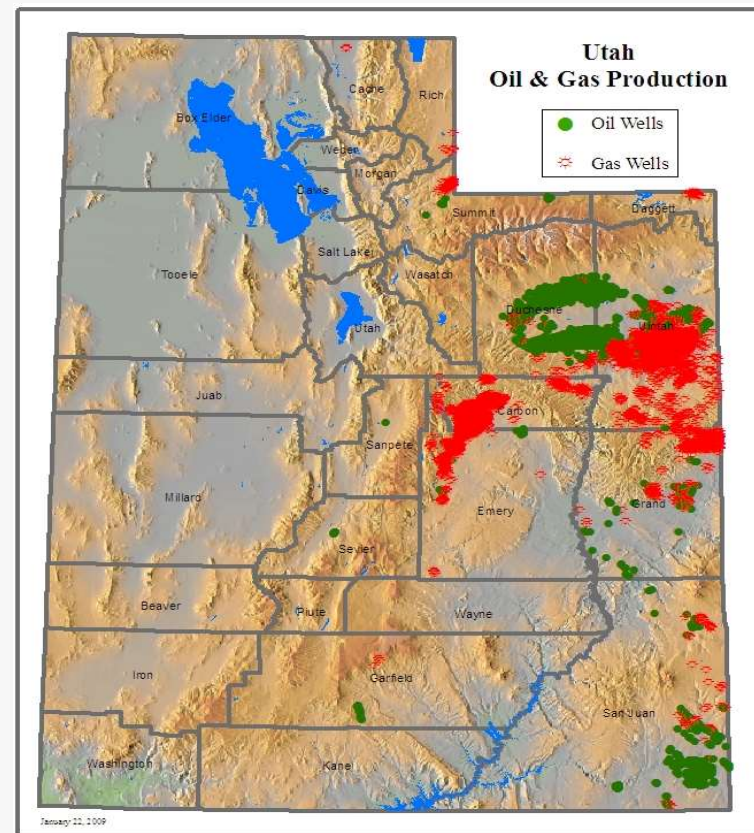
## ■ Gas Product Price

- If sold under contract, the price shall be the stated price as of January 1, adjusted for escalation and de-escalation
- If sold on the spot price market or to a direct end-user, the price shall be the average price received for the 12-month period immediately preceding January 1, adjusted for escalation and de-escalation

Utah Tax Code R884-24P-14 (1)

# Natural Gas Pricing Factors

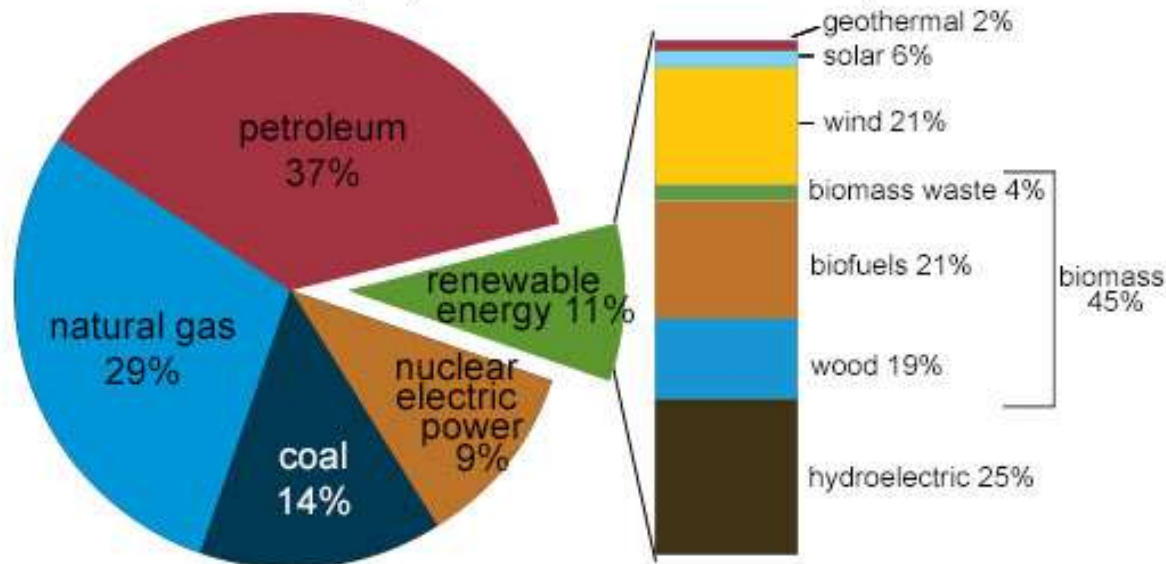
- Data Analysis:
  - Supply
  - Demand
  - Drilling
  - Production
- Other Variables
  - Weather
  - Economy



Source- DOGM

## U.S. energy consumption by energy source, 2017

Total = 97.7 quadrillion  
British thermal units (Btu)

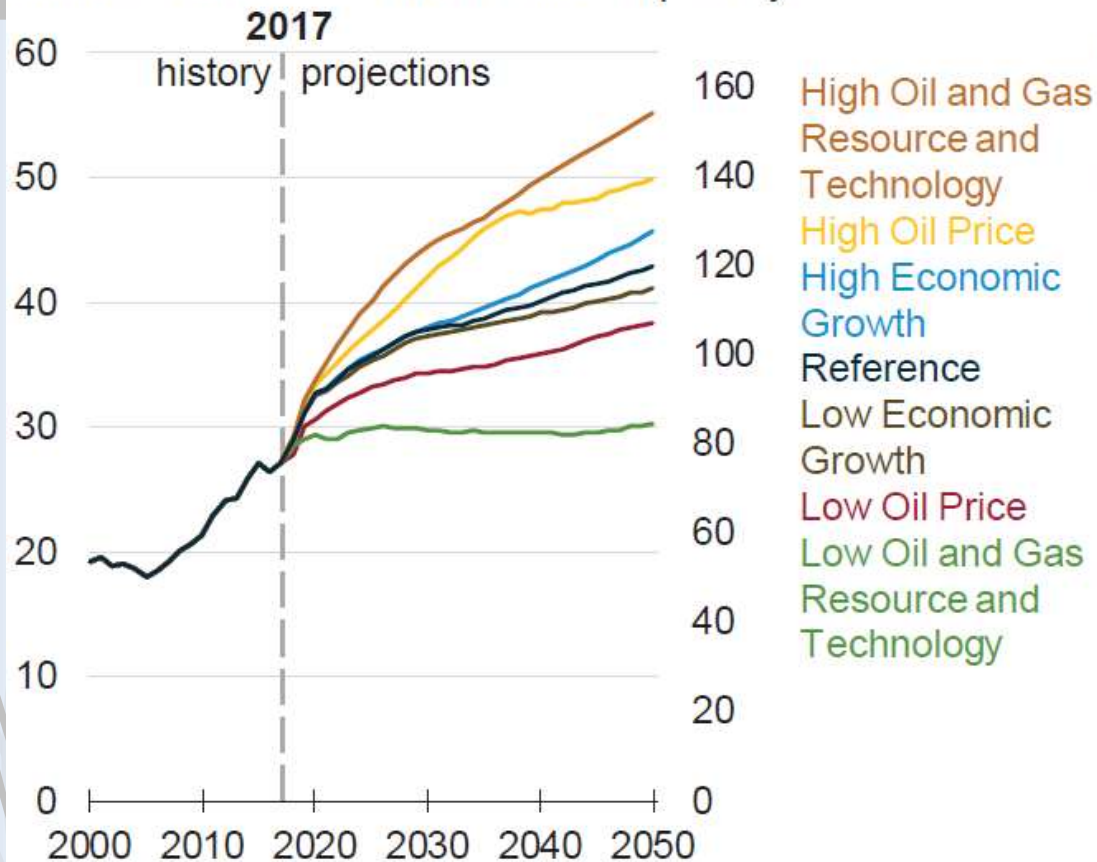


Note: Sum of components may not equal 100% because of independent rounding.  
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2018, preliminary data



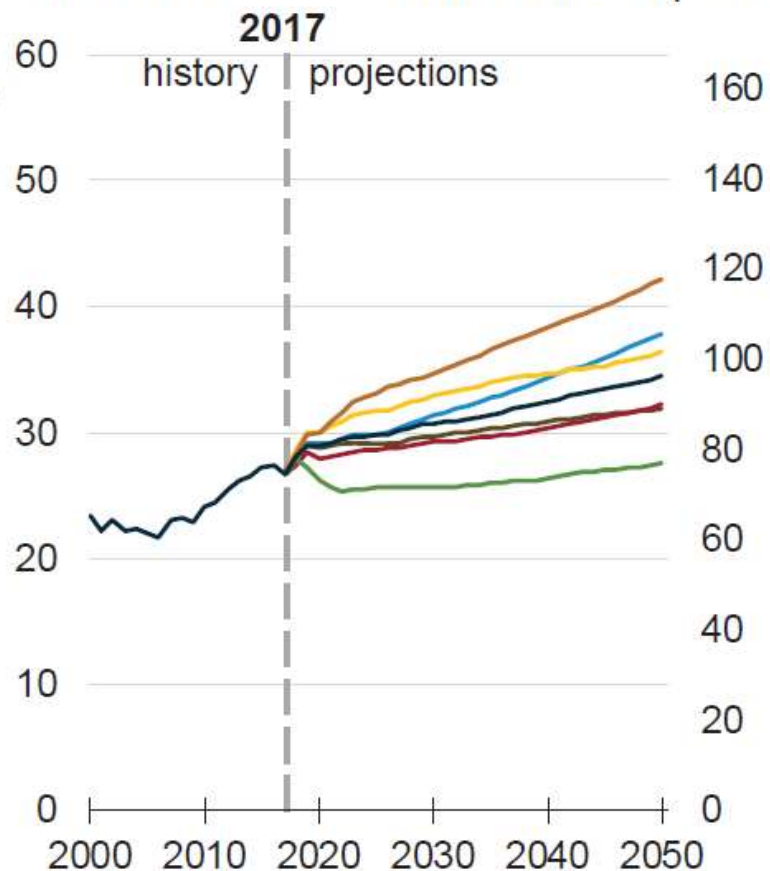
## Natural gas production

trillion cubic feet      billion cubic feet per day



## Natural gas consumption

trillion cubic feet      billion cubic feet per day



## Pressure Points on Gas Prices

- **Weather**- Forecasted to be similar to last year 
- **Economy**- Similar GDP growth from previous year 
- **Demand**- Projected small growth in residential, commercial, exports, and industrial 
- **Storage**- Forecasted to have the lowest amount of reserves since 2005 
- **Supply**- Projected increase in production 

Source- NGSA

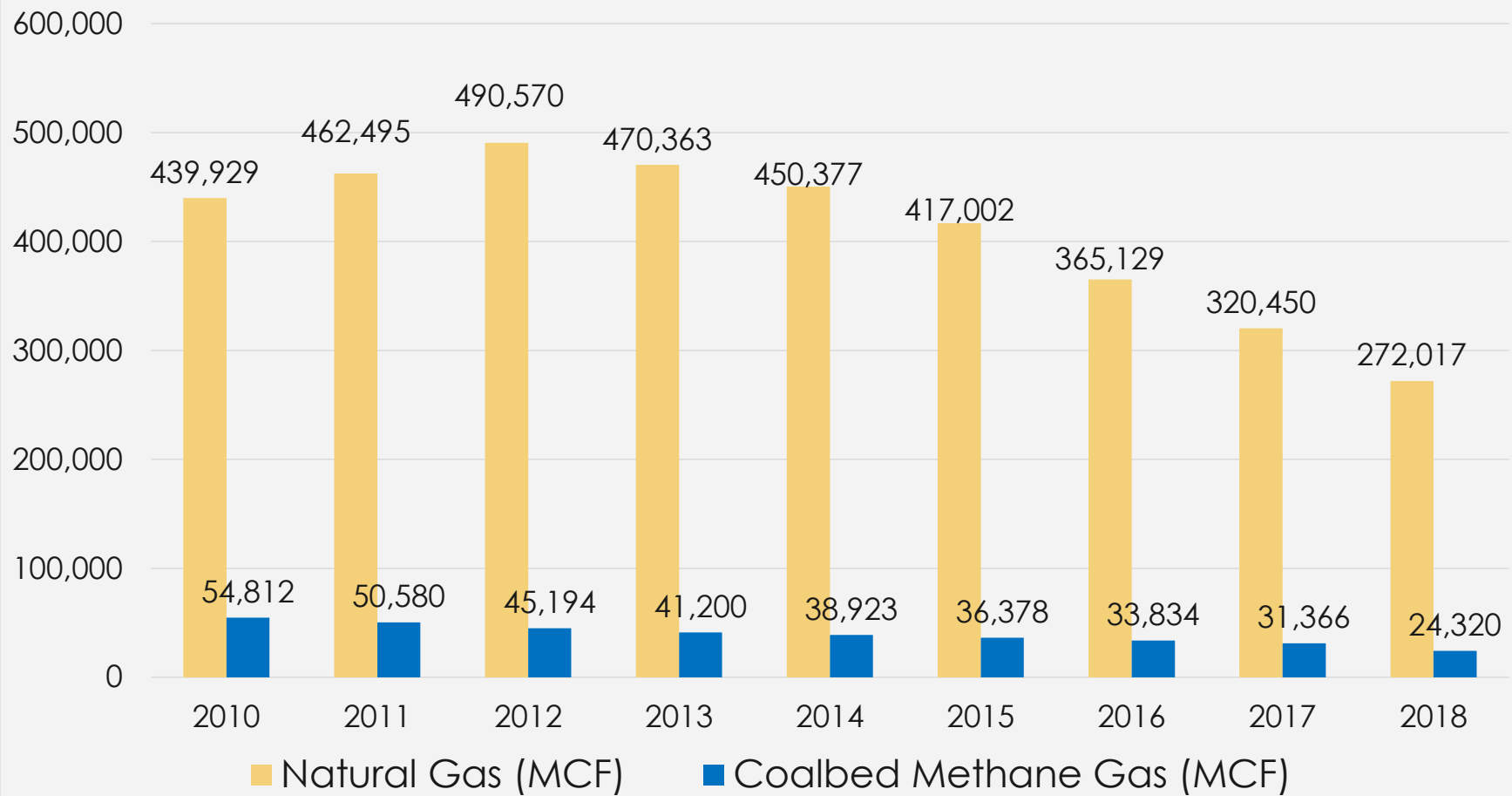
## 2018 Utah- Current Gas Well Count

Utah Gas Wells Plugged by Year			
2015	2016	2017	2018
76	164	56	85

Current Utah Gas Well Count	
Producing Gas Wells	7421
Shut-in Gas Wells	1898
Total	9319

Source- DOGM (Feb 2019)

## Utah Gas Production by Year



Source- DOGM (In thousands, 2018 is annualized)

# 2018 Henry Hub / Opal Differential

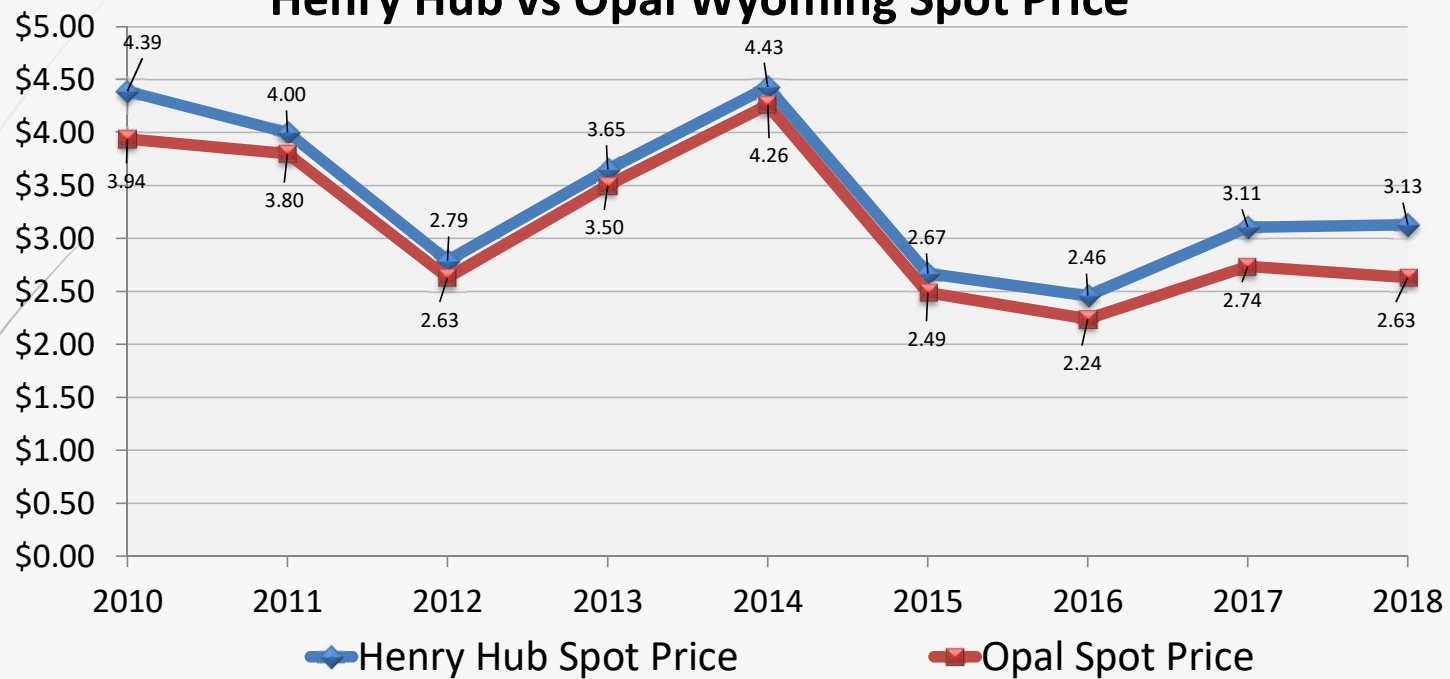
Month	Opal Gas Prices	Henry Hub Gas Prices	Differential
January	2.50	3.87	1.37
February	2.80	2.67	-0.13
March	2.17	2.69	0.52
April	1.85	2.80	0.95
May	1.90	2.80	0.90
June	2.09	2.97	0.88
July	2.24	2.83	0.59
August	2.41	2.96	0.55
September	2.32	3.00	0.68
October	2.32	3.28	0.96
November	3.23	4.09	0.86
December	5.76	4.04	-1.72
Average	2.63	3.17	0.53



### Northwest Pipeline Opal, Wyoming

Month	Weighted Price 2017	Weighted Price 2018	% Change
January	3.73	2.5	-33%
February	3.11	2.8	-10%
March	2.29	2.17	-5%
April	2.64	1.85	-30%
May	2.62	1.9	-27%
June	2.79	2.09	-25%
July	2.63	2.24	-15%
August	2.59	2.41	-7%
September	2.59	2.32	-10%
October	2.48	2.32	-6%
November	2.63	3.23	23%
December	2.73	5.76	111%
Year End Average Price	2.74	2.63	-4%

## Henry Hub vs Opal Wyoming Spot Price

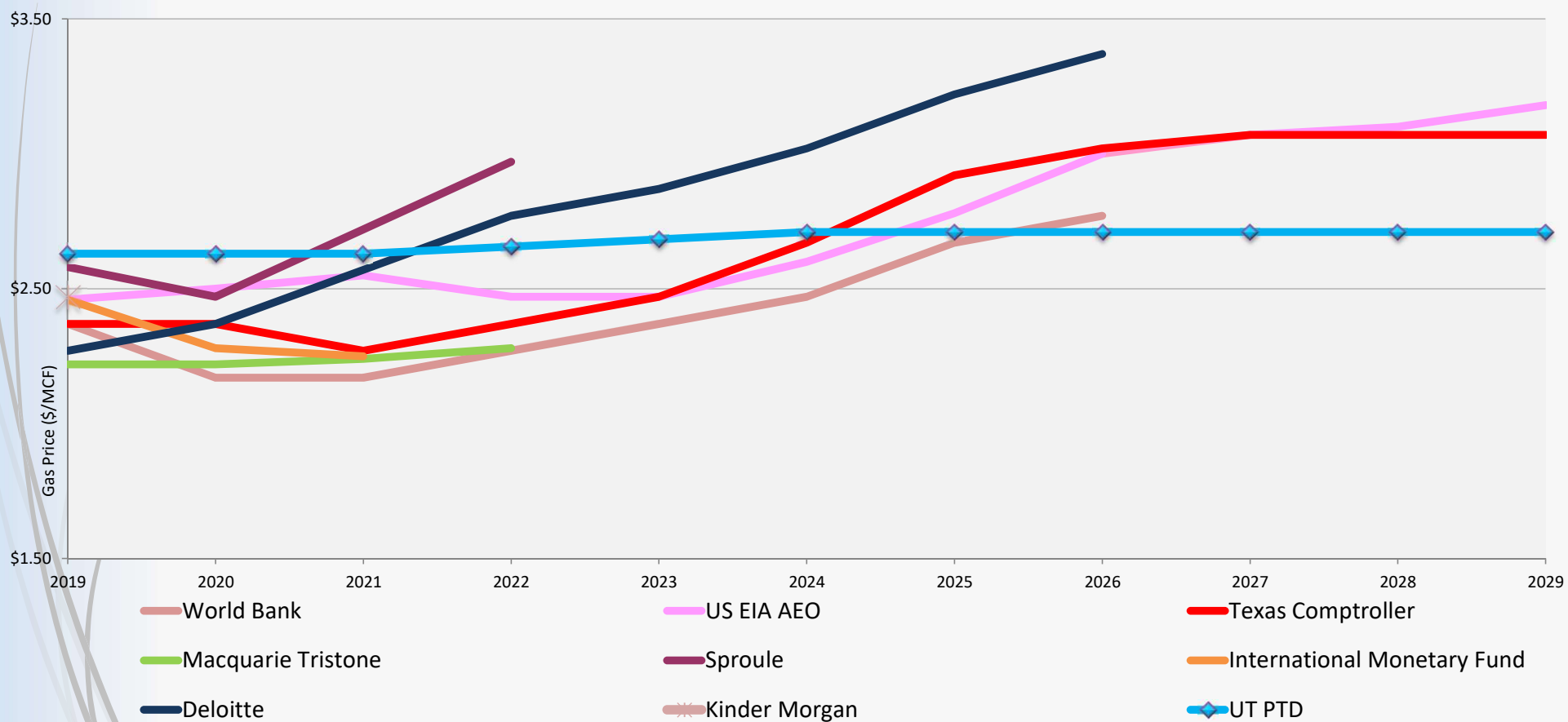




# Change in Application

- This year we will be basing the start price off of the contract price and using our escalation for the future values.

**2019 Gas Price  
Estimate Comparison  
Adjusted to Opal, Wyoming**



# 2019 Gas Price Forecast

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Start Price	2.63											
Forecast		2.63	2.63	2.66	2.68	2.71	2.71	2.71	2.71	2.71	2.71	2.71
% Change		0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%

# Sources for Natural Gas Price Forecasting

- U.S. EIA – United States Energy Information Administration
- International Monetary Fund
- Bank of America – Merrill Lynch
- Societe Generale
- Kinder Morgan
- NGSA- Natural Gas Supply Association
- NYMEX – (CME Group)
- Sproule Associates
- AJM Deloitte
- Texas Comptroller
- Macquarie Tristone
- World Bank



# TAX COMMISSION OIL FORECAST 2019



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- Energy Themes and Indirect Indicators
  - 2019 Industry Themes
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  - U.S. Economic Indicators
  - Utah Crude Oil Production
- Direct Indicators/Forecast variables
  - Pricing
  - Differentials
  - Forecast and Summary Calendar



# Disclaimer

- Forecasted numbers are opinions of value and are subject to significant economic factors unknown or not reported as of January 1, 2019





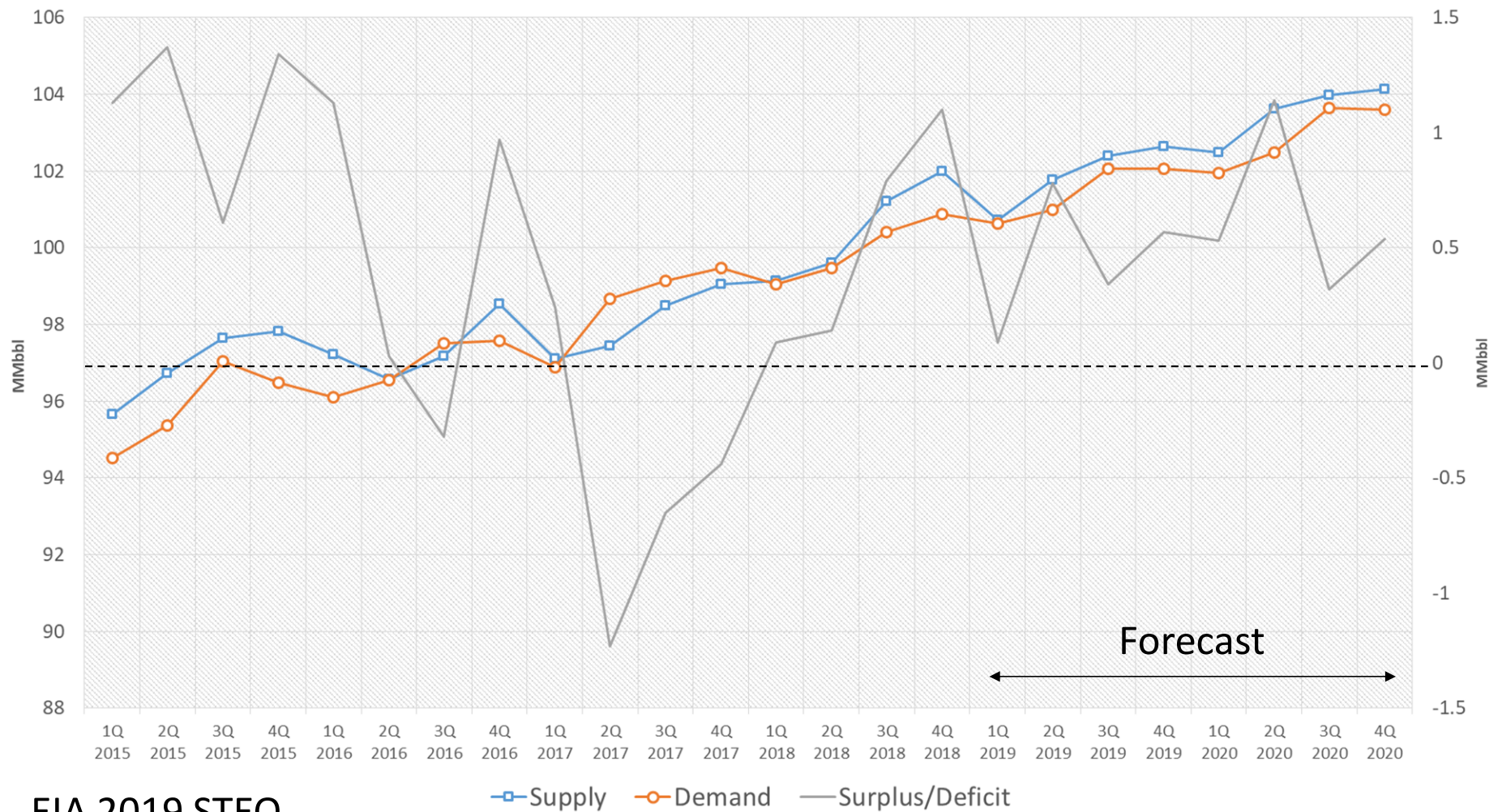
# Energy themes and indirect indicators



# EIA Annual energy outlook 2019

- U.S. becomes net energy exporter 2020 as production increases in oil, natural gas and NGL coupled with slow growth in energy consumption
- 2018 10.9 MMBBL/day
- 2.4% GDP growth in high case and 1.4% low
- Shift in power sector fuel-mix with growth in natural gas and intermittent renewables
- Tight reservoirs in Permian and Williston Basins underperforming by 10%-50% (Rystad Energy AS)
- OPEC, Russia coalition to cut production by 1.2 MMbbl/day

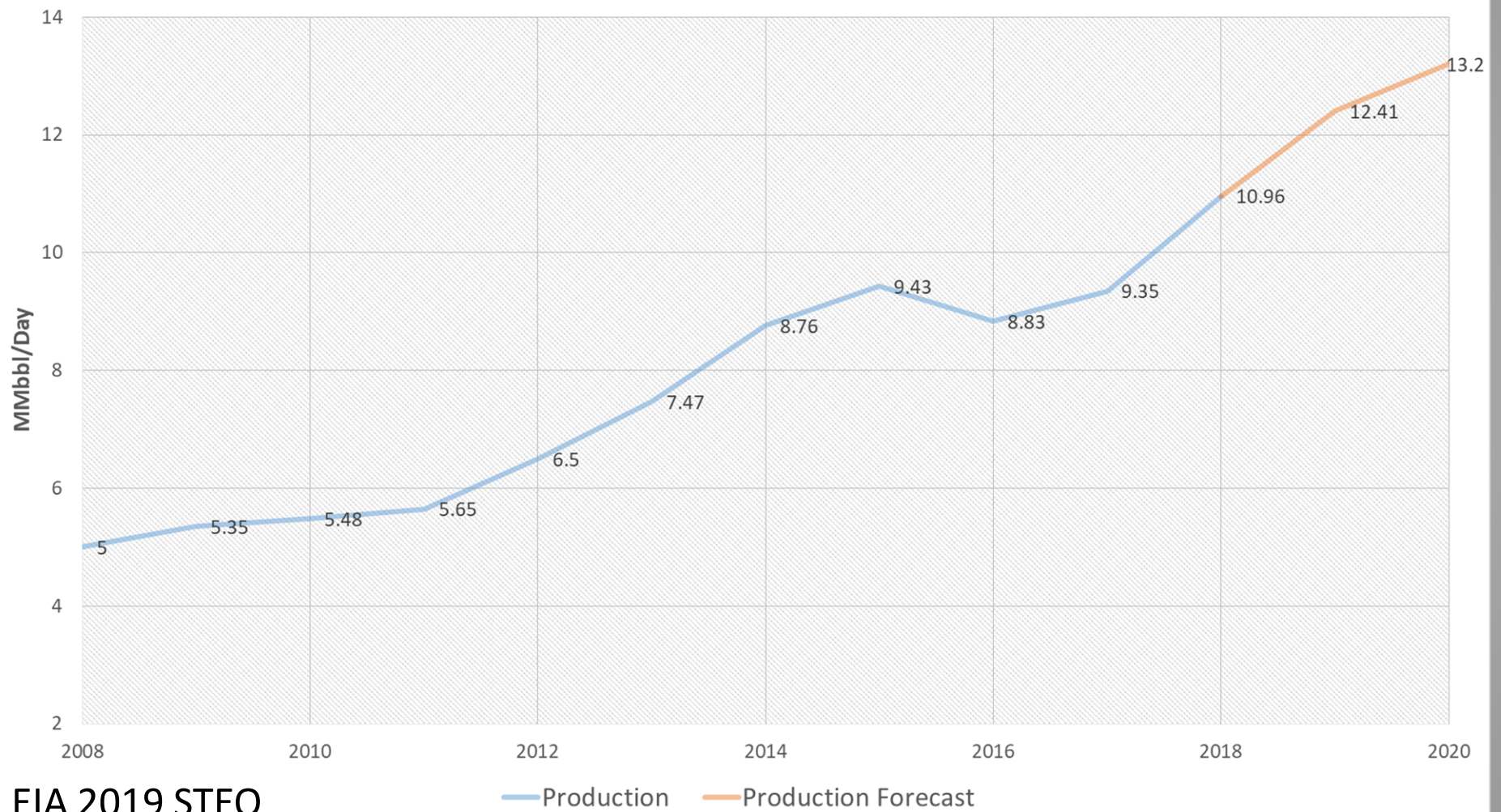
## World Crude Oil Supply and Demand (MMBL)



EIA 2019 STEO

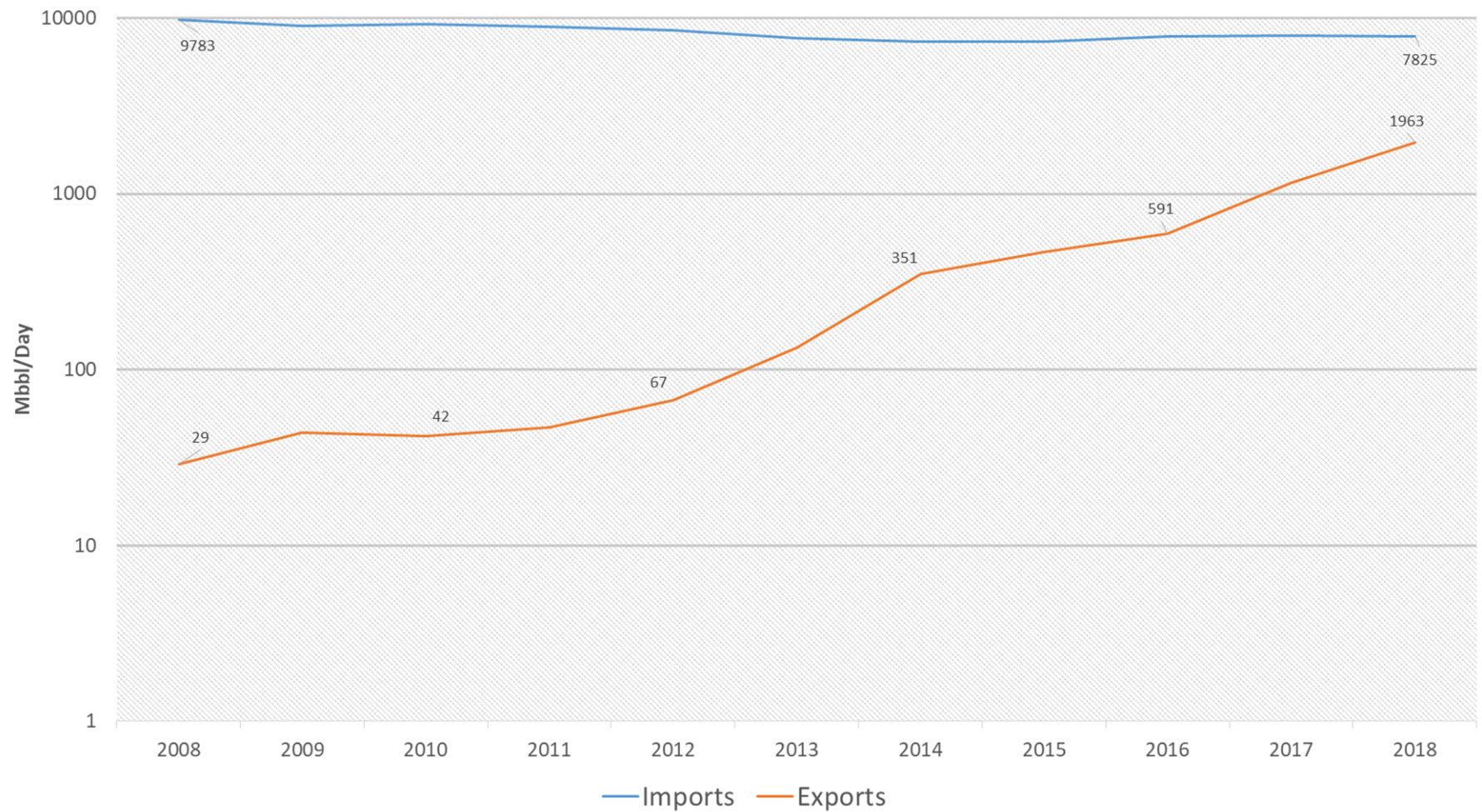


## U.S. Crude Oil Production 2008-2020



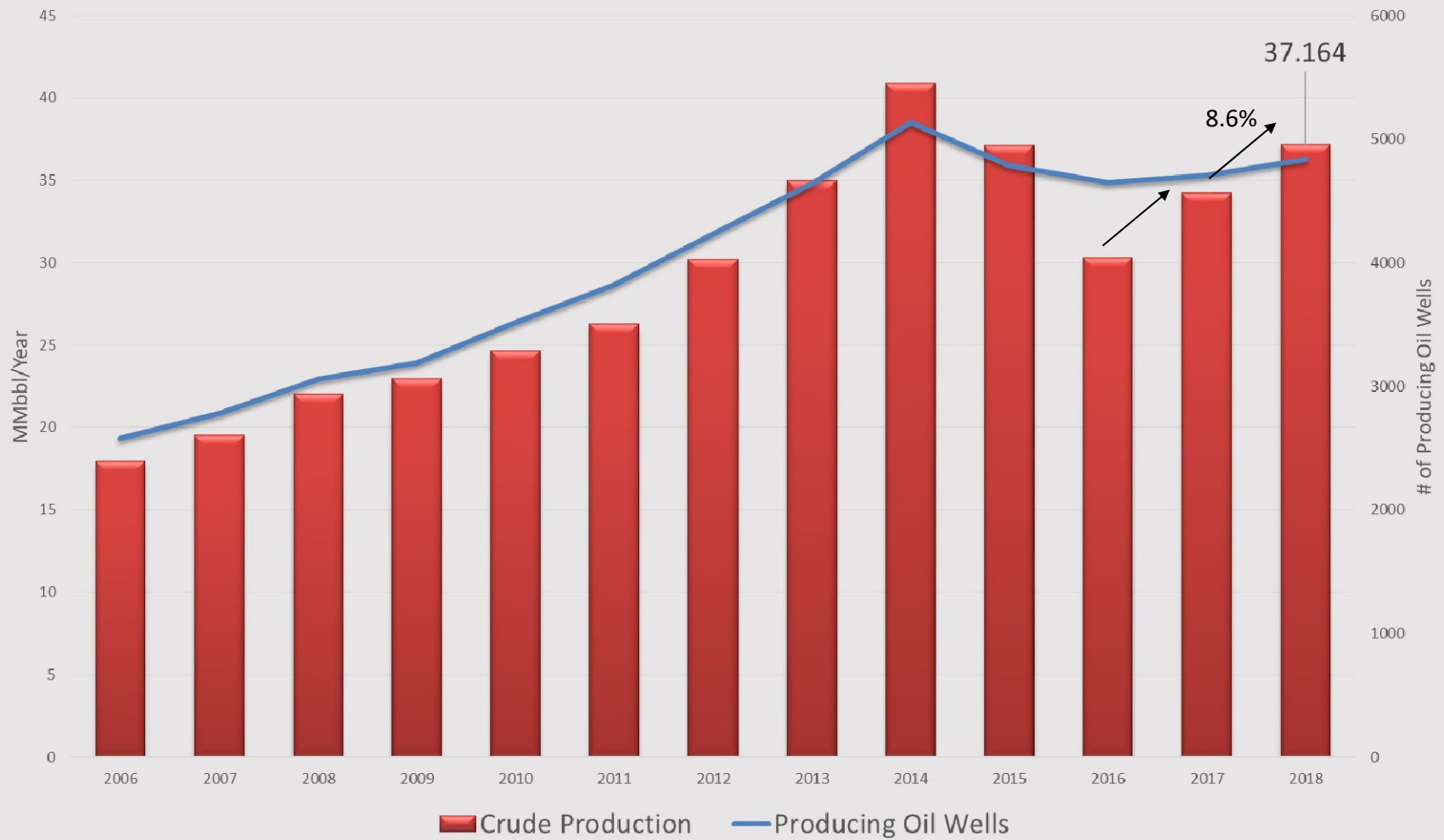
EIA 2019 STEO

## U.S. Crude Oil Imports VS Exports 2008-2018



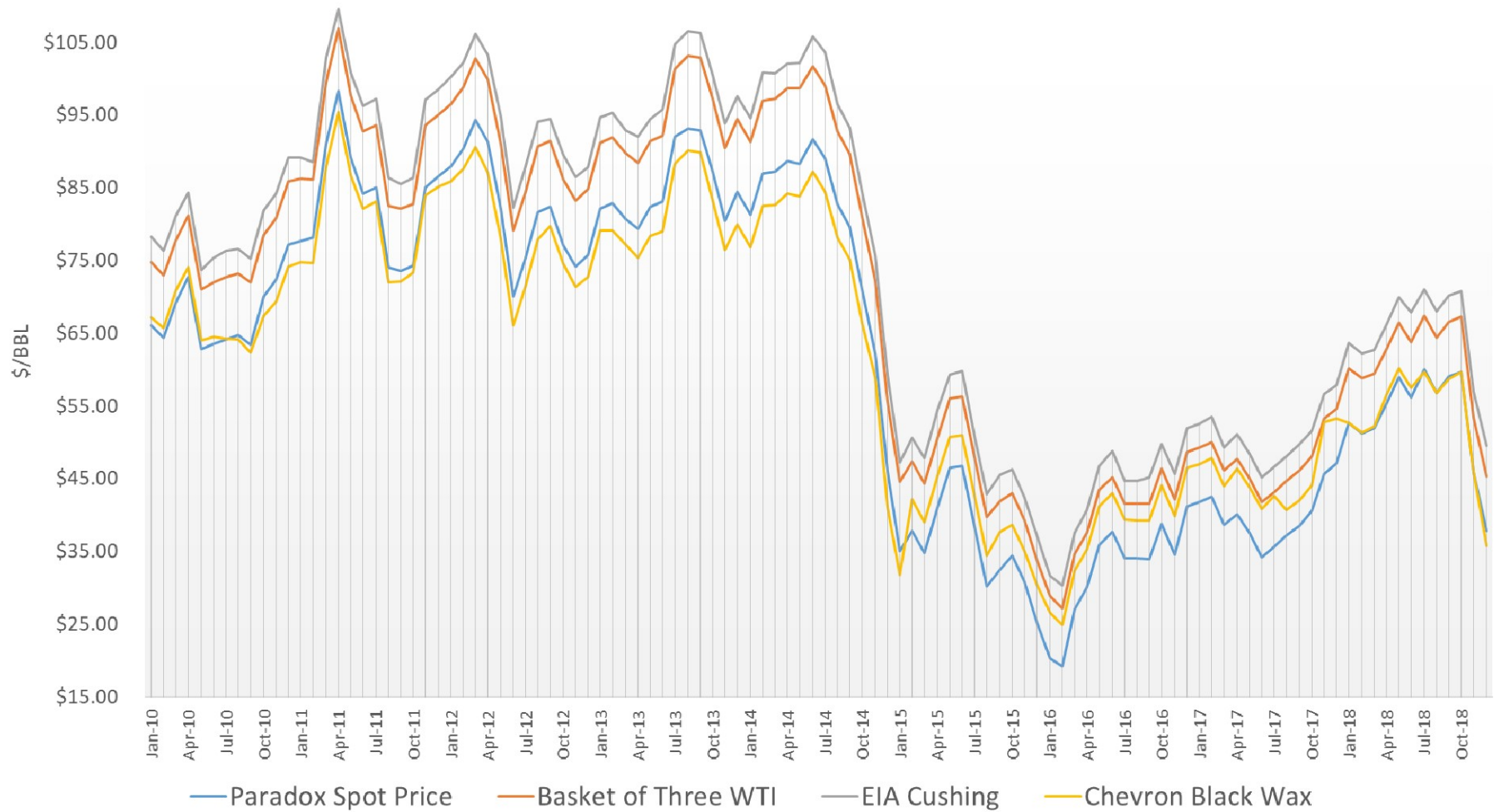
<https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=mcr&f=a>

## Utah Crude Oil Production 2018





## Crude Oil Spot Prices 2010-2018

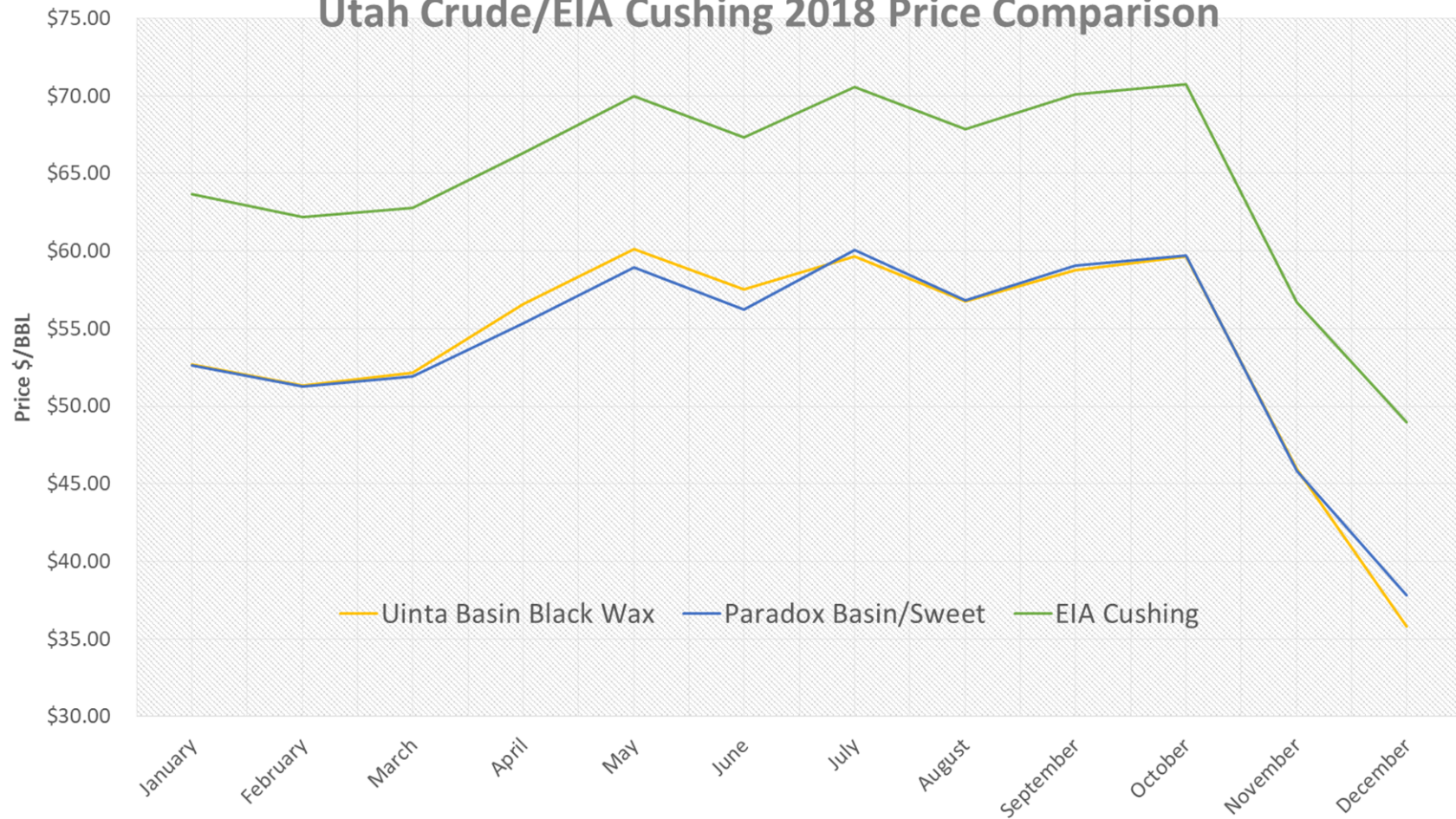




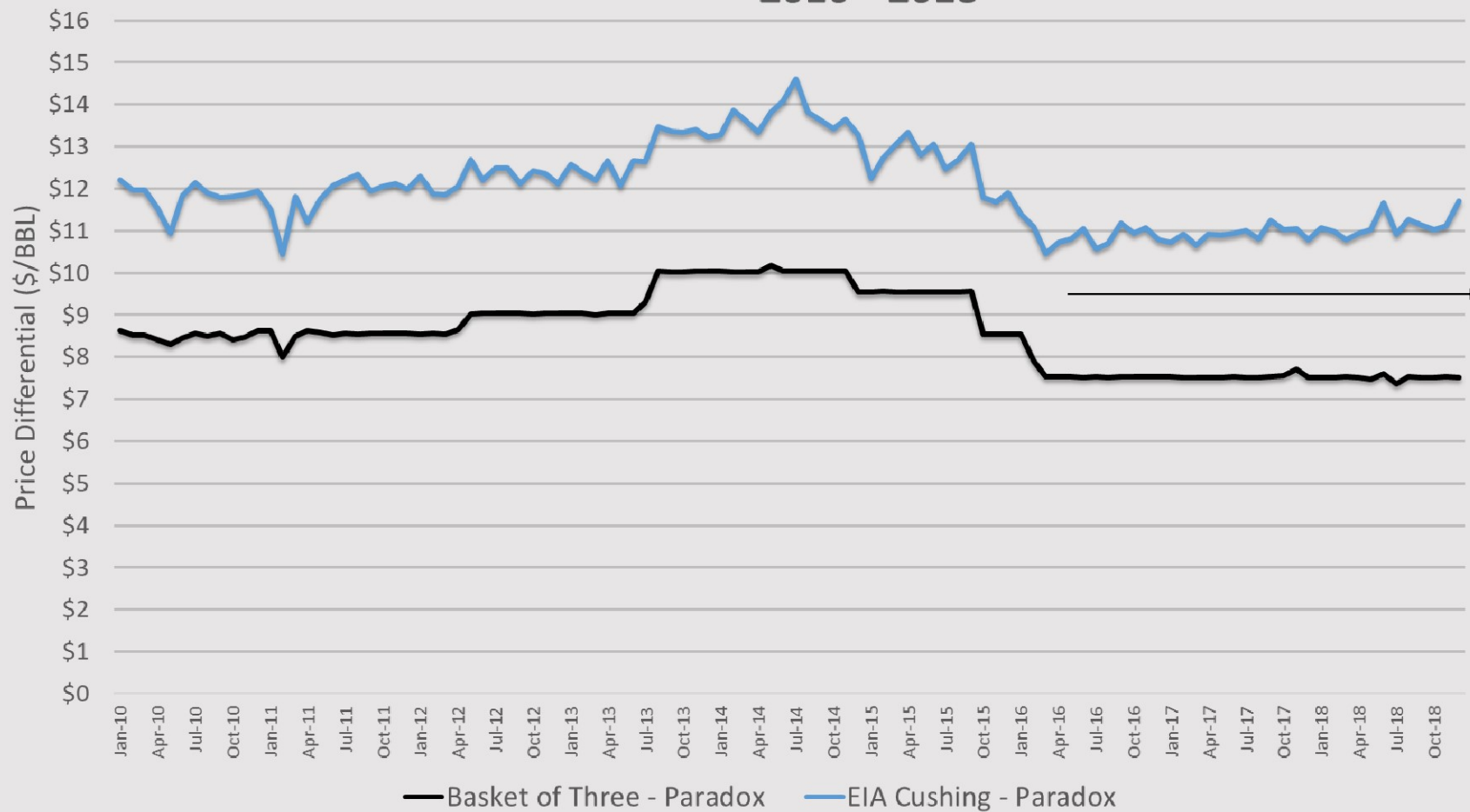


## Direct Indicators/Forecast variables

## Utah Crude/EIA Cushing 2018 Price Comparison



## WTI-Paradox-Black Wax Price Differentials 2010 - 2018



## Slide 43

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### EC1

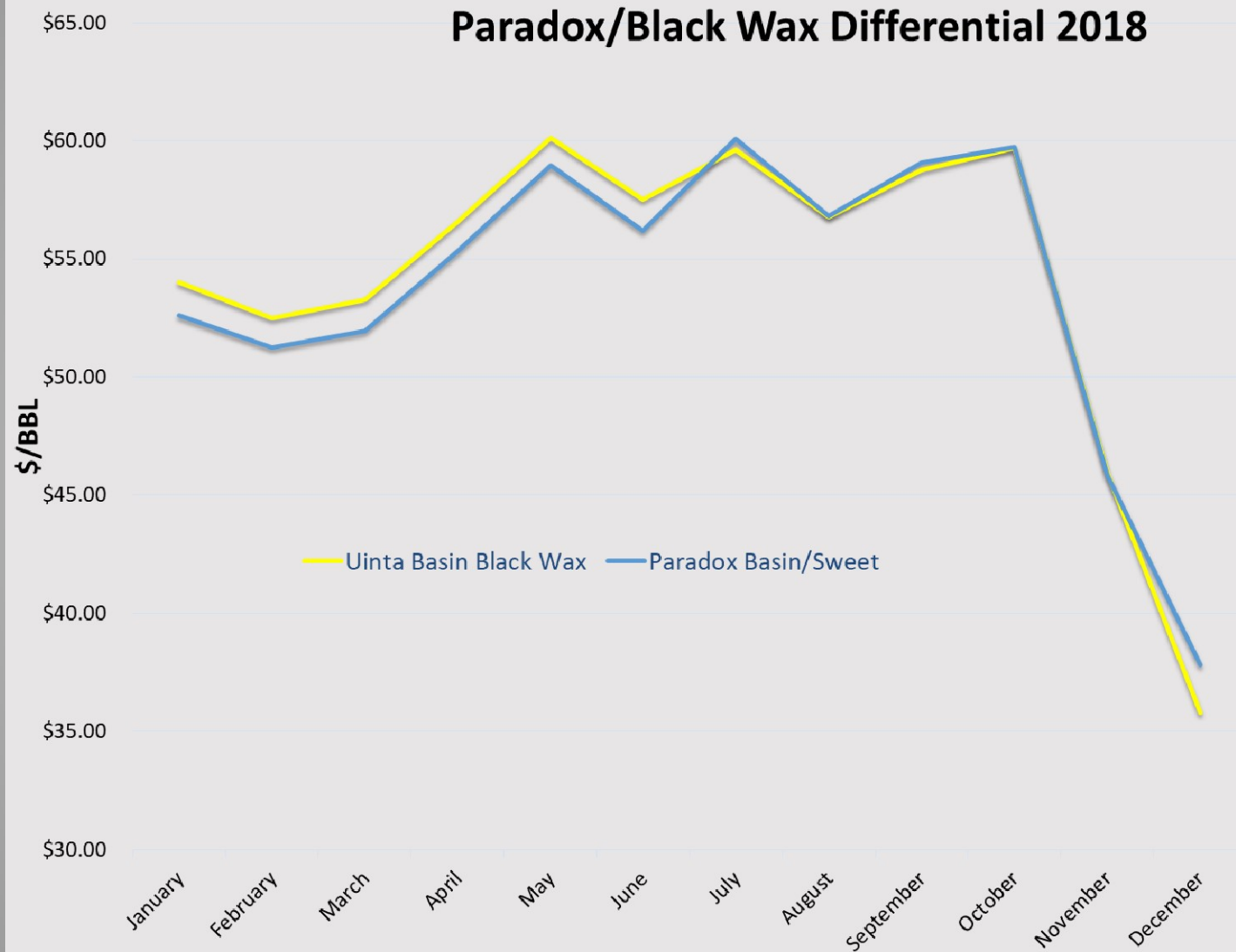
Differentials between EIA Cushing/Basket of Three WTI remain fairly consistent over the last 8 years. Hence, using a Texas WTI escalation seems reasonable

Ethan Cook, 2/24/2019

### 2019 Paradox Sweet/EIA Cushing Differential

Month	Paradox Sweet Prices	EIA Cushing Prices	Differential
January	\$ 52.62	\$ 63.66	\$ 11.04
February	\$ 51.25	\$ 62.18	\$ 10.93
March	\$ 51.94	\$ 62.77	\$ 10.83
April	\$ 55.32	\$ 66.33	\$ 11.00
May	\$ 58.89	\$ 69.98	\$ 11.09
June	\$ 56.20	\$ 67.32	\$ 11.12
July	\$ 60.07	\$ 70.58	\$ 10.51
August	\$ 56.81	\$ 67.85	\$ 11.04
September	\$ 59.09	\$ 70.08	\$ 10.99
October	\$ 59.72	\$ 70.76	\$ 11.04
November	\$ 45.85	\$ 56.69	\$ 10.84
December	\$ 37.82	\$ 48.98	\$ 11.16
Average	\$ 53.80	\$ 64.77	\$ 10.97

## Paradox/Black Wax Differential 2018



Avg. \$.41 diff.





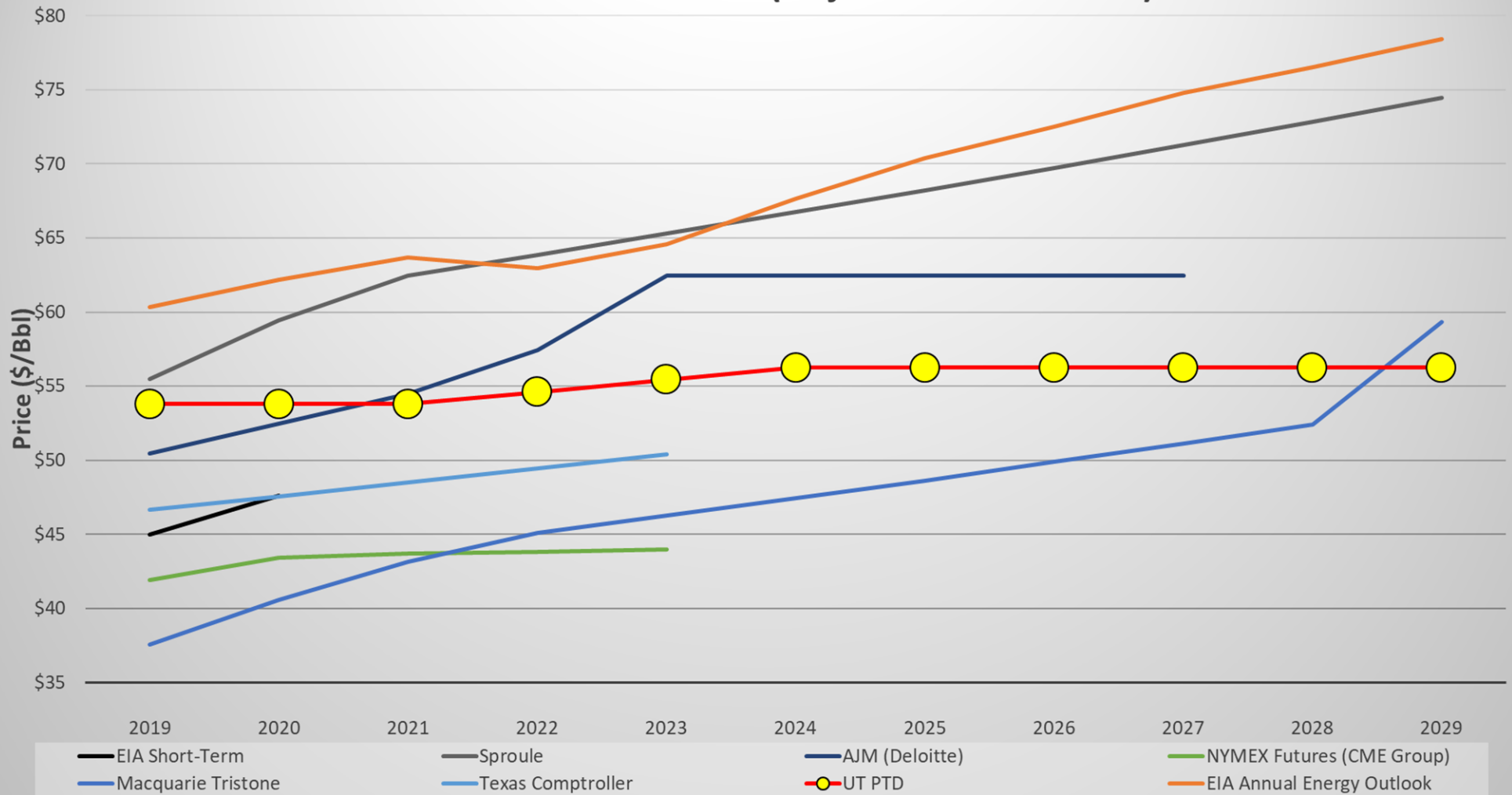
- Starting price is the weighted average posted price of the previous 12 months

Paradox Basin/Sweet- "Giant"				
	Posting	2017	2018	%
Month	Days	Price	Price	Change
January	31	\$ 41.77	\$ 52.62	26%
February	28	\$ 42.54	\$ 51.25	20%
March	31	\$ 38.67	\$ 51.94	34%
April	30	\$ 40.15	\$ 55.32	38%
May	31	\$ 37.59	\$ 58.89	57%
June	30	\$ 34.23	\$ 56.20	64%
July	31	\$ 35.62	\$ 60.07	69%
August	31	\$ 37.22	\$ 56.81	53%
September	30	\$ 38.57	\$ 59.09	53%
October	31	\$ 40.58	\$ 59.72	47%
November	30	\$ 45.60	\$ 45.85	1%
December	31	\$ 47.45	\$ 37.82	-20%
Year End Weighted Average Price \$/BBL		\$ 40.00	\$ <b>53.80</b>	35%



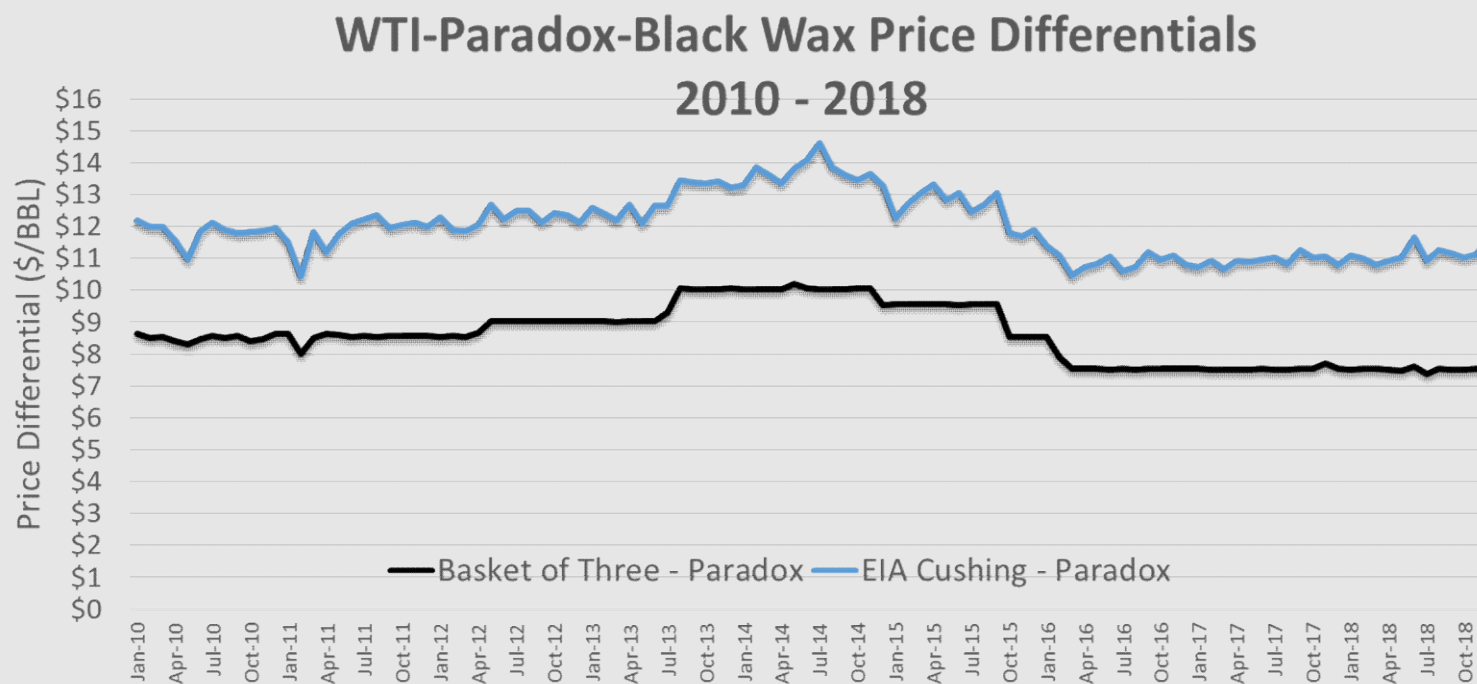
Uintah Black Wax- "Chevron"				
	Posting	2017	2018	%
Month	Days	Price	Price	Change
January	31	\$ 47.02	\$ 52.71	12%
February	28	\$ 47.80	\$ 51.35	7%
March	31	\$ 43.92	\$ 52.16	19%
April	30	\$ 46.33	\$ 56.57	22%
May	31	\$ 43.83	\$ 60.14	37%
June	30	\$ 40.88	\$ 57.53	41%
July	31	\$ 42.62	\$ 59.63	40%
August	31	\$ 44.22	\$ 56.76	28%
September	30	\$ 45.57	\$ 58.75	29%
October	31	\$ 47.58	\$ 59.68	25%
November	30	\$ 52.79	\$ 45.95	-13%
December	31	\$ 53.25	\$ 35.79	-33%
Year End Weighted Average Price \$/BBL		\$ 46.32	\$ <b>53.92</b>	17%

## 2019 Forecast Sources (Adjusted for Paradox)



# WHY?

- EIA Cushing/WTI Reference Crude differentials with Paradox Sweet has been relatively consistent over the last 8 years.



## 2018 Oil Price Forecast

### Paradox Basin

Forecast of 10 Year's Prices

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Average of 2018 Monthly Prices	<b>53.80</b>										
Forecast with High & Low to 2 std dev	<b>53.80</b>	53.80	53.80	54.61	55.43	56.26	56.26	56.26	56.26	56.26	56.26
% Increase / Decrease		0%	0%	1.5%	1.5%	1.5%	0.00%	0.00%	0.00%	0.00%	0.00%

## 2018 Oil Price Forecast

### Black Wax

Forecast of 10 Year's Prices

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Average of 2018 Monthly Prices	<b>53.92</b>										
Forecast with High & Low to 2 std dev	<b>53.92</b>	53.92	53.92	54.73	55.55	56.38	56.38	56.38	56.38	56.38	56.38
% Increase / Decrease		0%	0%	1.5%	1.5%	1.5%	0.00%	0.00%	0.00%	0.00%	0.00%

# Sources

U.S. EIA – United States Energy Information Administration

- Short Term Outlook (STO)
- Annual Energy Outlook (AEO)

EIU – Economist Intelligence Unit

- Economic and Commodity Prices Forecast

NYMEX (CME Group) – New York Mercantile Exchange for futures prices

Sproule Associates – Petroleum consultants annual forecast

AJM Deloitte – Petroleum consultant company annual forecast

Texas Comptroller –Pritchard & Abbott, Inc. Method

- Price Adjustment Factor(PAF) & Producer Price Index(PPI)

Macquarie Tristone – Energy lenders' price forecast survey

Moody's –Investor service forecast